

What is claimed is:

1 1. A method of imaging an aorta and aortic aneurysm of a
2 patient using magnetic resonance imaging, comprising,
3 performing a first imaging sequence to identify the
4 location of the aneurysm;
5 performing a second imaging sequence to image the aorta and
6 extent of the aortic aneurysm, including,
7 collecting image data; and
8 administering magnetic resonance contrast agent to the
9 patient while collecting image data, by intravenous
10 infusion, at a rate of infusion sufficient to provide a
11 substantially elevated concentration of the contrast agent
12 in the artery during collection of image data
13 representative of a center of k-space.

1 2. The method of claim 1 wherein the first imaging
2 sequence is a sagittal T1 weighted sequence.

1 3. The method of claim 1 wherein the second imaging
2 sequence is a plurality of images constructed from a dynamic 3D
3 volume.

1 4. The method of claim 3 wherein the plurality of images
2 include a plurality of coronal, sagittal or oblique projections.

1 5. The method of claim 1 further including the step of
2 performing at least a third imaging sequence for imaging the
3 size of the aortic aneurysm.

1 6. The method of claim 5 further including the step of
2 performing a fourth imaging sequence for imaging the size of the
3 aortic aneurysm wherein the third and fourth imaging sequences
4 are a plurality of sagittal and axial 2D time-of-flight images.

1 7. The method of claim 5 wherein the third imaging
2 sequence is a plurality of sagittal or axial 2D time-of-flight
3 images and further includes collecting imaging data while the
4 patient suspends respiration.

1 8. The method of claim 1 further including performing a
2 fifth imaging sequence for imaging right renal arteries.

1 9. The method of claim 8 wherein the step of performing
2 the fifth imaging sequence further includes collecting phase
3 contrast images.

1 10. A method of imaging aorta or aortic aneurysm using
2 magnetic resonance imaging, comprising,

3 performing a first imaging sequence to identify the
4 location of the aneurysm;

5 performing a second imaging sequence to image the aorta and
6 extent of the aortic aneurysm, including,

7 collecting image data; and

8 administering magnetic resonance contrast agent to the
9 patient prior to collecting image data, by intravenous
10 infusion, at a rate of infusion sufficient to provide a
11 substantially elevated concentration of the contrast agent
12 in the artery during collection of image data
13 representative of a center of k-space.

1 11. The method of claim 10 wherein the first imaging
2 sequence is a sagittal T1 weighted sequence.

1 12. The method of claim 10 wherein the second imaging
2 sequence is a plurality of images constructed from a 3D volume.

1 13. The method of claim 12 wherein the plurality of images
2 include a plurality of coronal, sagittal or oblique projections.

1 14. The method of claim 10 further including the step of
2 performing at least a third imaging sequence for imaging the
3 size of the aortic aneurysm.

1 15. The method of claim 14 further including the step of
2 performing a fourth imaging sequence for imaging the size of the
3 aortic aneurysm wherein the third and fourth imaging sequences
4 are a plurality of sagittal and axial 2D time-of-flight images.

1 16. The method of claim 14 wherein the third imaging
2 sequence is a plurality of sagittal or axial 2D time-of-flight
3 images and further includes collecting imaging data while the
4 patient suspends respiration.

1 17. The method of claim 10 further including performing a
2 fifth imaging sequence for imaging right renal arteries.

1 18. The method of claim 17 wherein the step of performing
2 the fifth imaging sequence further includes collecting phase
3 contrast images.

1 19. A method of imaging portions of the aorta or its major
2 branches in a patient using magnetic resonance imaging,
3 comprising,

4 performing a first imaging sequence to identify the
5 location of the aorta;

6 performing a second imaging sequence to image the lumen of
7 the aorta, including,

8 collecting image data representative of the center of
9 k-space while the patient suspends respiration; and

10 administering magnetic resonance contrast agent to the
11 patient, by intravenous infusion, at a rate of infusion
12 sufficient to provide a substantially elevated
13 concentration of the contrast agent in the artery during
14 collection of image data representative of a center of k-
15 space.

1 20. The method of claim 19 wherein the first imaging
2 sequence is a sagittal T1 weighted sequence.

1 21. The method of claim 19 wherein the second imaging
2 sequence is a 3D gradient echo volume.

1 22. The method of claim 19 further including performing a
2 third imaging sequence for collecting 3D phase contrast images
3 following the step of administering magnetic resonance contrast
4 agent.

1 23. A method of imaging aorta or renal arteries of a
2 patient using magnetic resonance imaging, comprising,

3 performing a first imaging sequence to identify the
4 location of the aorta and aorta branch vessels;

5 performing a second imaging sequence to image the lumen of
6 the aorta, including,

7 collecting image data; and

8 administering magnetic resonance contrast agent to the
9 patient prior to or while collecting image data, by
10 intravenous infusion, at a rate of infusion sufficient to
11 provide a substantially elevated concentration of the
12 contrast agent in the artery during collection of image
13 data representative of a center of k-space.

1 24. The method of claim 23 wherein the step of performing
2 the second imaging sequence includes collecting at least a
3 portion of the image data while the patient suspends
4 respiration.

1 25. The method of claim 23 wherein the step of performing
2 the second imaging sequence includes collecting at least a
3 portion of the image data corresponding to the center of k-space
4 while the patient suspends respiration.

1 26. The method of claim 23 further including the step of
2 performing at least a third imaging sequence for imaging the
3 size of the aortic aneurysm, after the second imaging sequence.